

Changes in the ozone ...

S/169/62/000/004/018/103
D228/D302

yer's thickness then subsequently decreases. [Abstracter's note:
Complete translation.] ✓

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89326

3,1800 (1041, 1062, 1176)

S/033/61/038/001/009/019
E032/E514

AUTHORS: Gindilis, L.M. and Pariyskiy, N.N.

TITLE: On the Intensity of the Principal Emission Lines of
the Night Sky in the Region of the Gegenschein

PERIODICAL: Astronomicheskii zhurnal, 1961, Vol.38, No.1,
pp.99-106

TEXT: The intensities of the lines $\lambda 5557$, 5893 and 6300 \AA were investigated. Spectrograms of the gegenschein were obtained with a fast nebular spectrograph having a focal ratio $f/0.7$ and a dispersion of 2000 \AA/mm at 5500 \AA . The observations were carried out in 1956 at the Alma-Ata Observatory and in October, 1957 at the High Altitude Station of GAISH near Alma-Ata ($H = 3060 \text{ m}$). The spectra were obtained on DH and P Φ -3 (RF-3) plates using an exposure of one hour and a slit width of 3 mm (1956), and OAF plates using an exposure of 30 min and a slit width of 4 mm (1957). The calibration was carried out using β -particle excited phosphors of the type described by Kharitonov on p.164 of the present issue. The relative intensity of the above lines in the region of the gegenschein and in the night sky were measured at the same zenith distance. Detailed numerical results are reproduced in a table.

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On the Intensity of the Principal Emission Lines of the Night Sky
in the Region of the Gegenschein

The mean relative intensities of the three lines were found to be $0.99 \pm 0.01_5$, $1.02 \pm 0.03_6$ and $1.08 \pm 0.04_0$, respectively. The observations give no indication of line intensification. Strictly speaking, this result has no connection with the concept of the gegenschein as the gaseous tail of the earth. It merely shows that these lines are not excited in the tail even if a tail does exist. A study of the principal emission lines in the region of the gegenschein does not provide information about the nature of the latter. A detailed study of the spectrum of the gegenschein in a wide spectral interval is necessary. There are 1 figure, 1 table and 17 references: 8 Soviet, 9 non-Soviet.

ASSOCIATION: Gos. astronomicheskii in-t im. P. K. Shternberga
(State Astronomical Institute imeni P.K. Shternberg)

SUBMITTED: July 11, 1960

Card 2/2

S/886/62/000/000/001/003
D207/D308

AUTHORS: Pariyakiy, N.N. and Gindilis, L.M.

TITLE: Investigation of the nature of gegenschein

SOURCE: Sbornik trudov MGU po Mezhdunarodnomu geofizicheskom godu; astronomiya. (Moscow) Izd-vo Mosk. univ. 1962, 3-30

TEXT: The discovery and the nature of the gegenschein (counterglow) are reviewed at length. A description is given of two very-high-speed low-dispersion nebular spectrographs: HCC (NSS), which is a glass prism instrument for the visible region and HKC (NKS), which is a quartz prism instrument for the violet and ultra-violet regions. These spectrographs were designed by V.I. Bedel and M.V. Lobachev and constructed under the direction of P.V. Dobychin in 1954. The spectrographs each had a tube which widened in front where there was a large precision-made nebular slit of 300 mm length, a prism and a camera with a simple collimator lens focused on the slit. They were used, along with a CN 63 (SP63) spectrograph

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Investigation of the nature ...

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for the 3800 - 9500 Å range, to observe the gegenschein near Alma-Ata (1956-57) and Dzhaylyau (1957-59) in the USSR and on Hainan Island (1958) in China. The most interesting results have been published already. Here the authors briefly mention that the gegenschein was exceptionally intense during strong aurora (the night of 29-30th September, 1957) and that the annual variation of the ecliptical latitude of the gegenschein, observed by many workers, is due to superposition of two effects: 1) a zodiacal light band, in which the matter is concentrated in a fixed Laplace plane at a distance of 2.5 astronomical units from the Sun; 2) light of different origin, the source of which is concentrated in the ecliptic (this may be partly due to the gas 'tail' of the earth). Part of the work was carried out together with the Institut fiziki Zemli AN SSSR (Institute of Physics of the Earth, AS USSR), the Astrofizicheskiy institut Akademii nauk Kazakhskoy SSR (Astrophysical Institute, AS Kazakh SSR), from which Z.V. Karyagina took an active part in the work, and the joint Soviet-Chinese expedition for the observation of the annular solar eclipse on April 19, 1958, in which the staff members of the Peking Geophysical Institute of the Academy of

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Investigation of the nature ...

S/886/62/000/000/001/003
D207/D308

Sciences of the Chinese People's Republic, Hu Jên-ch'ao and Yu Hai-jên, participated. There are 10 figures and 10 tables.

SUBMITTED: January 2, 1960

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S/886/62/000/000/002/003
D207/D308

AUTHORS: Pariyskiy, N.N., Hu Jen-ch'ao, Fomenko, B.D. and Gindilis, L.M.

TITLE: Measurements of the ozone layer during the annular solar eclipse on April 19, 1958, on Hainan Island

SOURCE: Sbornik: trudov MGU po Mezhdunarodnomu geofizicheskom godu; astronomiya. (Moscow) Izd-vo Mosk. univ., 1962, 31-53

TEXT: The observations during the eclipse were carried out by a joint Soviet-Chinese expedition led on behalf of the USSR Academy of Sciences by A.P. Molchanov, and on behalf of the Chinese Academy of Sciences by Ch'eng Fang-yung. The expedition was organized by the Chairman of the Astronomicheskii sovet AN SSSR (Astronomical Council, AS USSR) A.A. Mikhaylov and his deputy B.V. Kukarkin. On the Chinese side there was a special committee led by the Vice-President of the Chinese Academy of Sciences Wu Yu-hsiung. The optical group included N.N. Pariyskiy of the Institut fiziki Zemli AN

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Measurements of the ozone ...

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SSSR (Institute of Physics of the Earth, AS USSR) and the Gosudarstvennyy astronomicheskiy institut im. P.K. Shternberga (State Astronomical Institute imeni P.K. Shternberg), L.M. Gindilis of the State Astronomical Institute imeni P.K. Shternberg, Hu Jen-ch'ao and Yu Hai-jen, both of the Peking Geophysical Institute of the Academy of Sciences of the Chinese People's Republic. The optical group was led by N.N. Pariyskiy. The results were analyzed by B.D. Fomenko of the Stalingradskiy pedagogicheskiy institut im. A.S. Serafimovicha (Stalingrad Pedagogical Institute imeni A.S. Serafimovich) under the direction of N.N. Pariyskiy. The time service was provided by the Chinese scientists Ch'eng Fang-yung and Wang Shou-kuan. The observations were carried out at the south extremity of Hainan Island at a latitude of about $+18^{\circ}.3$. The variations in the ozone layer thickness during the eclipse were observed together with the gegenschein using a very-high-speed nebular spectrograph MKC (NKS) with quartz-lithium fluoride optical parts; the spectrograph is described in detail in the article of N.N. Pariyskiy and L.M. Gindilis. Since the NKS spectrograph was designed primarily for observations of the gegenschein and zodiacal light, a special photometric

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Measurements of the ozone ...

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attachment was used to adapt it for ozone line measurements. The ozone spectrum (3000 - 3400 Å) showed a general tendency for the ozone-layer thickness to increase up to 1 hour after the climax of the eclipse. A detailed analysis will be published in a separate communication. There are 4 figures and 7 tables.

SUBMITTED: January 2, 1960

Card 3/3

GINDILIS, L. M.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Institute of Atmospheric Physics 1962:

"Absolute Spectrophotometry of Counter-Radiance [protivosiyaniye]."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

S/033/62/039/001/010/013
E032/E514

35120

AUTHOR: Gindilis, L.M.
TITLE: Absolute spectrophotometry of the continuous spectrum of counter-glow

PERIODICAL: *Astronomicheskii zhurnal*, v.39, no.1, 1962, 93-106
TEXT: Several years ago N. N. Pariyskiy is said to have initiated absolute systematic studies of the spectrum of counter-glow in order to elucidate the nature of this phenomenon. A special spectrograph was developed for this purpose and the observations were begun in 1955. The principles of the method employed and some preliminary results were reported by the present author and Pariyskiy in Refs. 1-5 (Ref.1: *Astron.tsirk.*, No.179, 1957; Ref.2: *Astron.zh.*, 36, 539, 1959; Ref.3: *Ibid*, 36, 1078, 1959; Ref.4: *Ibid*, 38, 99, 1961, Ref.5: *Sbornik trudov Gos. astron. in-ta im. P. K. Shternberga po MGG*, 1961). In the present paper the author discusses the results of a spectrophotometric analysis of some of the data obtained during 1957-1959. It is a continuation of work reported in Ref.3. All the observations

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Absolute spectrophotometry ...

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were carried out at the high altitude station of GAISH in the Zailiyskiy Alatau mountains (H = 5000 m). Analysis in the range 4200-6500 Å shows that the brightness of the counter-glow varies considerably with time and increases with increasing airglow intensity: both effects may be due to the same cause, for example, a corpuscular stream. The integral brightness of counter-glow in the above wavelength region for magnetically quiet days was found to be $1.1 \pm 0.05 \cdot 10^{-4}$ erg/cm² sec sterad, the visual brightness was $6^m.1$ deg⁻² and the average contrast is ~ 11%. During geomagnetic disturbances the brightness was found to increase. Figs. 3 and 4 show the energy distribution (corrected for atmospheric effects) for magnetically quiet and disturbed days, respectively. These distributions were fitted with a curve of the form

$$G_o(\lambda) = c \lambda^{-x} F_{\odot}(\lambda) \quad (16)$$

(Ref.3) and a least squares calculation was found to yield

$$G_o(\lambda) = 3.05 \cdot 10^{-13} \lambda^{-1.74} F_{\odot}(\lambda) \quad (17)$$

where $F_{\odot}(\lambda)$ is the average monochromatic intensity of the solar
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Absolute spectrophotometry ... ³³⁴²⁶
S/O33/62/039/001/010/013
E032/E514

disc without correction for absorption lines. It is pointed out that this type of scattering of solar light would correspond to solid cosmic dust particles. Finally, the distribution shown in Fig. 4 (magnetically disturbed days) can be fitted with an expression of the form

$$G_{\odot}(\lambda) = 1.05 \cdot 10^{-13} \lambda^{-0.78} F_{\odot}(\lambda) = 3.03 \cdot 10^{-13} \lambda^{-1.74} F_{\odot}(\lambda) + 0.11 \cdot 10^{-13} F_{\odot}(\lambda).$$

All these observational results are said to be consistent with the results of I. S. Astapovich (Ref.10: Astron.tsirk., No.190, 25, 1958). Acknowledgments are expressed to N. N. Pariyskiy who initiated this work and gave valuable advice. There are 4 figures, 4 tables and 14 references: 11 Soviet-bloc and 3 non-Soviet-bloc. The English-language reference reads as follows: Ref.8: Roach, Rees, The Airglow and Aurorae, London, Pergamon Press, 1956, p.143. X

ASSOCIATION: Gos. astronomicheskiy in-t im. P.K.Shternberga
(State Astronomical Institute imeni P.K.Shternberg)

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Absolute spectrophotometry ..

33426

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E032/E514

SUBMITTED: April 7, 1961

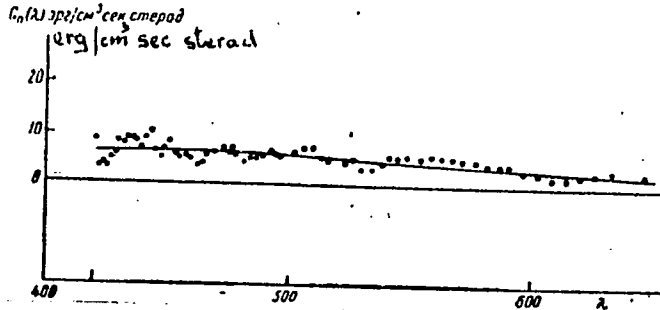


Fig. 3

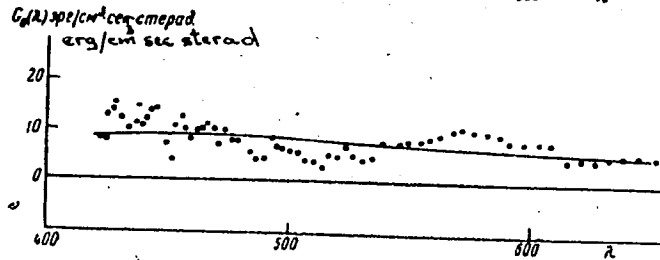


Fig. 4

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3.1550

39540
S/O33/62/039/004/006/008
E032/E514

AUTHOR: Gindilis, L.M.

TITLE: The counter glow as the effect of scattering of solar light by interplanetary dust particles

PERIODICAL: Astronomicheskii zhurnal, v.39, no.4, 1962, 689-701

TEXT: This paper is concerned with the optical theory of counter glow in which the latter is interpreted as being due to the scattering of solar light by interplanetary dust particles. The analysis is mainly concerned with the photometric profile of counter glow and the energy distribution in its spectrum. In order to account for the known properties of counter glow, the following assumptions must be made. It is necessary that a certain fraction of dielectric particles must be present in order to account for the enhanced brightness at the antisolar point. The spatial distribution of the dust may be either constant or decreasing in accordance with the r^{-1} law, or finally, there may be a tendency for the dust to concentrate in the asteroid region. The latter gives the best agreement with the observed photometric profile at angular distances of 180 to 160° from the sun. The

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The counter-glow as the ...

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size distribution of the particles $n(a)da = Ca^{-p} da$ is such that $p = 4$ or 5 . When $p = 4$, 90 to 95% of absorbing particles with an albedo of $A \sim 0.1$ are required in addition to the dielectric particles. When $p = 5$ the counter-glow may be explained by scattering off dielectric particles only. This value of p gives better agreement with the observed energy distribution in the counter-glow spectrum. A higher value of p would not yield the observed photometric profile. In the case of a constant or r^{-1} particle density, the number of particles with radii greater than 0.6μ is found to be approximately $5 \cdot 10^{-13} \text{ cm}^{-3}$. If the dust is preferentially accumulated in the asteroid region, then the average concentration in that region should be of the order of 10^{-12} and their concentration at the earth's orbit then turns out to be less than 10^{-13} cm^{-3} ($a > 0.6 \mu$). The general conclusion is that with suitable adjustment of the particle parameters the optical theory is capable of explaining the main feature of counter-glow. There are 4 tables and 1 figure.

ASSOCIATION: Gos. astronomicheskii in-t im. P.K.Shternberga
(State Astronomical Institute imeni P.K.Shternberg)
SUBMITTED: June 28, 1961
Card 2/2

FEDOROV, Ye.P.; KUCHEROV, N.I.; BATRAKOV, Yu.V., kand.fiz.-matem.nauk;
KOSTYLEV, K.V., kand.fiz.-matem.nauk; MIKHEL'SON, N.N., kand.
fiz.-matem.nauk; GINDILIS, L.M., kand.fiz.-matem.nauk

In the Astronomic Council; conferences and plenums. Vest. AN SSSR
34 no.9:112-120 S '64. (MIRA 17:10)

1. Chlen-korrespondent AN UkrSSR (for Fedorov).

ACCESSION NR: AP4017623

S/0033/64/041/001/0116/0121

AUTHOR: Gindilis, L. M.; Karyagina, Z. V.

TITLE: Energy distribution in the counter glow spectrum in the region $\lambda\lambda 3900-6500 \text{ \AA}$

SOURCE: Astronomicheskii zhurnal, v. 41, no. 1, 1964, 116-121

TOPIC TAGS: spectrometry, astrophysics, nebular spectrograph, counter glow, counter glow spectrum

ABSTRACT: The spectral investigations of the counter glow, which have been made over the past few years with the aid of the Pariyskiy nebular spectrograph, have made it possible to determine several characteristic peculiarities of this phenomenon. Together with the conclusion regarding the absence of any intensification of primary emission lines of the night sky in the region of the counter glow, the presence of a continuous counter glow spectrum has been established. Energy distribution in the counter glow spectrum in the region $\lambda 4600-6500 \text{ \AA}$ was found to be very close to the energy distribution in the zodiacal light spectrum; however, in the $4300-4500 \text{ \AA}$ region a clearly expressed excess was detected in comparison with the spectrum of zodiacal light. It was also determined that

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ACCESSION NR: AP4017623

the energy distribution in the counter glow spectrum in the $\lambda\lambda 4250-6500 \text{ \AA}$ region corresponds to scattered solar light with an intensity proportional to λ^{-x} , where x lies within the range 1-2, with the most probable value $x = 1.74$. Observations of the energy distribution in the counter glow spectrum in the $\lambda\lambda 3900-6500 \text{ \AA}$ region were made by N. N. Pariyskiy with a nebular spectograph (glass and quartz cameras) during 1957-1959. The energy distribution curve is given in Figure 1 of the Enclosure. It can be represented by $I(\lambda) = c\lambda^{-x}E_0(\lambda)$, where $E_0(\lambda)$ is the non-atmospheric spectral illumination from the Sun at the mean distance from the Earth to the Sun. In the computations, the value of $E_0(\lambda)$ as given by Johnson (F. S. Johnson, Jour. of Meteor., 11, 431, 1954) is adopted. The parameter x is computed by the method of least squares: $x = 1.28 \pm 0.16$. The continuous spectrum of the counter glow is the solar spectrum scattered by solid particles of interplanetary dust. Orig. art. has: 2 figures and 1 formula.

ASSOCIATION: Astronomicheskii in-t im. P. K. Shternberga (The K.P. Shternberg Astronomical Institute); Astrofizicheskii in-t. Akademii nauk KazSSR (Astrophysical Institute, Academy of Sciences, KazSSR)

SUBMITTED: 17Dec62

DATE ACQ: 18Mar64

ENCL: 01

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L 3670-66 EWT(d)/FBD/FSS-2/EWT(1)/FS(v)-3 DB/GW/WS-4

ACCESSION NR: AP50L4060

UR/0384/65/000/001/0018/0027

AUTHOR: Gindilis, L. M. (Candidate of physico-mathematical sciences)

51
B

TITLE: The possibilities of communication with extraterrestrial civilizations

4

SOURCE: Zemlya i Vselennaya, no. 1, 1965, 18-27

TOPIC TAGS: extraterrestrial radio wave, communication signal identification, radio source, radio telescope, radio wave propagation, space communication, space environment

ABSTRACT: A detailed analysis is presented of the possibility of communicating with extraterrestrial civilizations. Modern instruments and methods of astronomy have transferred this possibility from the realm of fantasy to the field of theoretical and experimental research. Modern instruments can penetrate to a distance of 10 million light years. Within this radius exist 10^{10} galaxies or $\sim 10^{21}$ stars. Life need not necessarily be similar to the terrestrial. The number of civilizations in our galaxy can be represented by

$$N_c = Nk_1k_2p_1p_2/(t_c)$$

where N is the number of stars in the galaxy and N_c is the number of civilizations,
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ACCESSION NR: AP5014060

k_1 is the factor accounting for the presence of a planetary system, k_2 is the factor accounting for the life-supporting possibilities, p_1 is the probability of life existing under favorable conditions (probability = 1), p_2 the probability that life has evolved to an intelligent form, and $f(t_c)$ the factor accounting for the durability of a civilization. The last factor has supporters for both the short range and long range theory. The value for our civilization may be 0.25-0.5. The most precisely determinable factor is k_1 , and many feel that k_1 is ~ 1 . The factor k_2 is difficult to evaluate, but probably lies in the limit 10^{-6} - 0.06. This would give 10^5 - 10^{10} planets in our galaxy capable of supporting life. It is likely that p_2 also equals 1. The possibilities of civilization existence extends from one in every five neighboring galaxies to 10^5 per galaxy. The communications could be of three types: a) direct contact or exchange of information; b) contacts along a communications channel; c) contacts of a combined type (sending out a space probe and receiving information). The possibilities of these three types are explored for different distances. It is concluded that for distances of less than 100 light years all three types are possible and that for longer distances one-way communication is favored. Relativity

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ACCESSION NR: AP50L4060

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considerations are used in computing the times involved. Radio waves present the most favorable form of communication. The strength of the radio signal depends both on distance and on the transmitter energy output, so the civilizations are classed in three types, depending on the energy requirements: type K I (approximately the same technical level of development as our civilization) has an energy requirement of $10^{19} - 10^{24}$ erg/sec; K II with 10^{33} erg/sec, which means that this civilization has completely mastered the energy of its star; and K III with an energy requirement of $10^{44} - 10^{45}$ erg/sec, which means that it has mastered the energy of the entire galaxy. For communications with earth-like (K I) civilizations, radiations near the wavelength of hydrogen (21 cm) seem to be a natural choice, and it is used in experiments with passive listening (such as Green Banks in the USA). Although results have not been favorable to date, equipment is being improved and the program continued. Probability calculations for two type K I civilizations contacting each other with this random scanning of space were made. If type K II or K III civilizations exist, the possibility of communications with them is greatly enhanced. Orig. art. has: 5 figures, 2 tables, and 2 formulas.

ASSOCIATION: none

SUBMITTED: 00

NO REF SOV: 000

SUB CODE: AA,EC

ENCL: 00
OTHER: 000

Card 3/3 BVK

L 58358-65 EWT(1)/EWG(v)/EWA(d)/EEC-4/EEC(t) Pe-5/Pac-2 GH
ACCESSION NR: AT5018691 UR/2955/65/000/002/0066/0095

AUTHOR: Gindilis, L. M.

TITLE: Dust matter in interplanetary and near-earth space

SOURCE: AN SSSR. Kosmos, no. 2, 1965, 66-95

TOPIC TAGS: interplanetary dust, near earth dust, circumterrestrial dust, dust cloud, twilight, zodiacal light, gegenschein, Fraunhofer corona, cosmic dust, meteoric matter

ABSTRACT: The author presents a comprehensive discussion, based on Soviet and Western sources, of the nature of the dust material in interplanetary and near-earth space, noting the importance of such research in space travel as, for example, the question of meteoritic erosion of spaceships. The article is divided into six parts: meteors and cosmic dust on the earth, rocket and satellite measurements, optical phenomena associated with interplanetary dust, properties of interplanetary dust, the dynamics of meteoritic matter in the solar system, and the origin of interplanetary dust. The dust matter in the solar system originates in the disintegration of periodic comets and asteroids and eventually is drawn into the sun by gravitational force. The process is constant and in a state of dynamic equilibrium. The density

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L 58358-65

ACCESSION NR: AT5018691

of this medium is very low, ranging from 10^{-23} to 10^{-21} g/cm³. Nonetheless, the dust particles scatter sunlight and thus indirectly account for the occurrence of such phenomena as zodiacal light, the zodiacal band, the Fraunhofer corona, twilight, and gegenschein. The dust matter is found chiefly in the plane of the ecliptic, concentrated near the planets owing to the gravitational pull. Since the particles often travel around the sun in elliptical orbits at a velocity of several tens of kilometers per second, they constitute some danger to the outer skin of satellites and spacecraft. Orig. art. has: 3 figures and 4 formulas. [DM]

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: ES, AA

NO REF SOV: 000

OTHER: 000

ATD PRESS: 4047

Card

JR
2/2

L 36266-66 EWT(1)/FCC GW

ACC NR: AR6015223

SOURCE CODE: UR/0269/65/000/012/0058/0058

AUTHOR: Gindilis, L. M. 39

TITLE: Absolute measurements of the constant luminescence spectrum of the night sky ✓

SOURCE: Ref. zh. Astronomiya, Abs. 12.51.446

REF SOURCE: Sb. Polyarn. siyaniya i svecheniye nochn. neba. No. 11. M., Nauka, 1965, 26-34

TOPIC TAGS: luminescence spectrum, night sky, atmospheric optic phenomenon ✓

ABSTRACT: The measurement results of the absolute spectrum of the continuum of the night sky in $\lambda\lambda 4200-6500$ zone are presented. These measurements were carried out in Zailiyskiy Ala-Tau Mountains at an altitude of 3000m in September and October 1957. [Translation of abstract] [NT]

SUB CODE: 03

Card 1/1

UDC: 551.593.5

ACC NR: ~~AP5018437~~ SOURCE CODE: UR/0384/65/000/003/0063/0063
AP7002456

AUTHOR: Gindilis, L. M. (Candidate of physico-mathematical sciences)

ORG: none

TITLE: Discovery of a variable radiation source

SOURCE: Zemlya i Vselennaya, no. 3, 1965, 63, 69

TOPIC TAGS: ~~astronomy~~, stellar astronomy, radio astronomy, ~~radio astronomy~~,
stellar radiation, cosmic radiation source, ~~astronomic personnel~~, stellar emission

ABSTRACT: Since September 1964, Soviet radio astronomers G. B. Sholomitskiy, M. G. Darionov, and N. F. Sleptsova of the State Astronomical Institute im. P. K. Shternberg have been carrying out systematic measurements of radio emissions coming from stellar radiation source CTA-102. In order to avoid errors inherent in absolute measurements, radiation from this source was compared with the radiation of radio source 33-48, observed simultaneously. The measurements showed that the ratio between the emissions from CTA-102 and 3C-48 varied within a range of 30%. Since the radiation intensity of 3C-48 was shown to be uniform, the variability of the CTA-102 radio source appears to be an undisputed fact. Orig. art. has: 1 figure.

SUB CODE: 03/ SUBM DATE: none/

Card 1/1

PROKOF'YEVA-BEL'GOVSKAYA, A.A.; GINDILIS, V.M.

Identification of human chromosomes. Izv. AN SSSR. Ser. biol.
no.2:188-200 Mr.-Ap '65. (MIRA 18:4)

1. Institute of Radiation and Physico-Chemical Biology, Academy
of Sciences of the U.S.S.R., Moscow.

BOGDANOV, Yu.F.; IORDANSKIY, A.B.; GINDILIS, V.M.

Problem of multistrand chromosome model. Genetika no.5:82-100
N '65. (MIRA 19:1)

1. Institut molekulyarnoy biologii AN SSSR, Moskva. Submitted
August 25, 1965.

SOV/98-59-8-2/33

14(10,11), 18(5)

AUTHORS: Naymushin, I., Head, Gindin, A., Chief Engineer, Shergin, D., Secretary of the Party Committee, Georgiyevskiy, S., Secretary

TITLE: Open Letter From the Workers on the Bratsk Construction Project

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1959, Nr 8, pp 3-4 (USSR)

ABSTRACT: As mentioned in the opening article, this is an open letter sent to all construction sites, industrial undertakings, technical institutes, and to the workers on the Krasnoyarsk GES project in particular. Based on the resolutions of the June Plenum of the Central Committee of the Soviet Communist Party, and born of a desire to hasten the fulfillment of the plan, the letter calls for help to be extended by more experienced teams to those in a less fortunate position. In particular, it calls for aid from the workers of the town of Angarsk, the Glavmosstroy and the Glavmospromstroyaterialov of the Mosgorispolkom (Moscow City Executive Committee) in this field of housing construction on the Bratsk site, admitting its inexperience in this sphere; from the Krivoy Rog ore-mining team in the construction of the Korshunov

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SOV/08-59-8-2/33

Open Letter From the Workers on the Bratsk Construction Project

iron-ore combine (output 12 million tons a year); from timber combines, in order to help with the construction of the largest wood-processing enterprise in the USSR (output 4 million cubic meters a year); and from the Academy of Construction and Architecture of the Ukrainian SSR in the field of the removal of earth and rock by means of explosives. In return, the Bratsk workers on the Padun Falls offer their help and experience to all who need it, especially to the workers on the Krasnoyarsk site on the Yenisey, who lag behind the former somewhat in the fulfillment of their part of the plan to provide a network of power stations in Siberia.

ASSOCIATION: Bratskgesstroy (Bratsk Construction Project) (Naymashin): Bratskiy gorkom KPSS (Bratsk Town Committee, CPSU (Georgiyevskiy))

Card 2/2

GINDIN, A.

Concrete operations in building the Bratsk Hydroelectric Power
Station. Na stroi. Ros. no.3:5-8 D '60. (MIRA 14:6)

1. Glavnyy inzh. stroitel'stva Bratskoy gidroelektrostantsii.
(Bratsk Hydroelectric Power Station--Concrete construction)

GINDIN, Aton Mendelevich; AZARKH, M., otv. red.; BOROZDIN, B., red.
izd-va; FOGODIN, Yu., red.izd-va; TELEGINA, T., tekhn. red.

[How the Bolsheviks nationalised private banks; facts and documents on the post-October days in Petrograd]Kak bol'sheviki natsionalizirovali chästnye banki; fakty i dokumenty posle-oktiabr'skikh dnei v Petrograde. Predisl. I.I.Mintsa. Moskva, Gosfinizdat, 1962. 141 p. (MIRA 16:2)

(Leningrad--Banks and banking)
(Leningrad--Revolution, 1917-1921)

GINDIN, A. P.

PA IT46

USSR/Medicine - Blood Circulation
Hyperimmunized Plasma

Mar 1947

"The Volume of Circulating Blood in Hyperimmunized
Plasma Donors (Serum Horses)," A P Gindin, 3 pp

"Byul Eksper Biol I Med," Vol XXIII, No 3 (Summary)

Circulation in horses is increased by $1\frac{1}{2}$. Increase
in amount of blood is conditioned by the increase in
the amount of plasma.

IT46

GINDIN, A. P.

PA 13/49T49

USSR/Medicine - Amyloidosis
Medicine - Liver

Jul/Aug 48

"Problem of Localization of Intercellular Amyloids,"
A. P. Gindin, Path Lab, Cen Inst Epidemiol and Micro-
biol, 3 3/4 pp

"Arkhiv Patologii" Vol X, No 4

Reports observations on horses, with two sketches.
Concludes that prolonged hyperimmunization of horses
with gangrenous, tetanic, diphtheric, and other
antigens results in amyloidosis of the liver.

13/49T49

SHEVELEV, A.S.; GINDIN, A.P., zaveduyushchiy; KRONTOVSKAYA, M.K., professor, zaveduyushchiy; TIMAKOV, V.D., professor, direktor.

Study of peritoneal rickettsiosis in connection with the effect of splenectomy and block upon the morphologic reaction of the organism. Zhur.mikrobiol.epid. i immun. no.9:12-16 S '53. (MLRA 6:11)

1. Sypnotifoznyy otdel Instituta epidemiologii i mikrobiologii im. pochetnogo akademika N.F.Gamalei Akademii meditsinskikh nauk SSSR (for Krontovskaya).
2. Patomorfologicheskaya laboratoriya Instituta epidemiologii i mikrobiologii im. pochetnogo akademika N.F.Gamalei Akademii meditsinskikh nauk SSSR (for Gindin).
3. Institut epidemiologii i mikrobiologii im.pochetnogo akademika N.F.Gamalei Akademii meditsinskikh nauk SSSR (for Timakov).
(Peritoneum--Diseases) (Rickettsia) (Spleen--Surgery)

GINDIN, A.P.; FORSETER, Kh.K.

Pathogenesis of atypical forms of infectious processes following antibiotic therapy; experiments with Breslau infections in mice. Zhur.mikrobiol.epid.i immun. no.5:73-76 My '55. (MIRA 8:7)

1. Iz otdela infektsionnoy patologii i eksperimental'noy terapii (zav.-prof. Kh.Kh.Planel'yes) i patogistologicheskoy laboratorii (zav.-prof. A.P.Gindin) Instituta epidemiologii i mikrobiologii imeni N.F.Gamalei AMN SSSR (dir.-prof. G.V.Vygodchikov).

(SALMONELLA INFECTIONS, experimental,
breslau, eff. of chlorotetracycline)
(CHLORTETRACYCLINE, effects,
on exper. Salmonella breslau infect.)

GINDIN, A.P.; YATSIMIRSKAYA-KROMTOVSKAYA, M.K.; ZHIV, B.V.; SALAGOVA,
T.A.

Pathomorphology of local reactions to the inoculation of the
typhus vaccine following sedimentation. Zhur.mikrobio.epid.
i immun. no.7:69-71 J1 '55. (MLRA 8:10)

1. Iz Instituta epidemiologii i mikrobiologii imeni N.F.
Gamalei AMN SSSR dir. prof. G.V.Vygodchikov.
(TYPHUS, immunology,
vaccine, local reactions)
(VACCINES AND VACCINATIONS,
typhus vaccine, local reactions)

USSR/Medicine - Tularemia Immunogenesis

FD-3394

Card 1/1 Pub. 17-18/22

Author : Kalitina, T. A. and *Gindin, A. P.

Title : Morphological character of tularemia skin reaction

Periodical : Byul. eksp. biol. i med. 8, 66-68, Aug 1955

Abstract : Authors studied reaction to tularin (allergen used in diagnosing tularemia) using skin biopsies from 21 immune and 3 non-immune guinea pigs. Non-sensitized (non-immune) animals showed only a slight skin reaction; in immune animals, the reaction was prolonged and more severe. Histomorphological and histo-pathological findings, effects on the organs and other tissues are described. Authors conclude that reaction following administration of the vaccine strain or of tularin was less malignant than the reaction from the virulent strain. 7 references, 7 USSR, 3 since 1940.

Institution : Tularemia Laboratory (Head: Prof N. G. Olsuf'yev) and Patho histological Lab (*Head) Inst of Epidemiology and Microbiology imeni N. F. Gamaleya (Dir. Active Mem Acad Med Sci USSR Prof G. V. Vygodchikov) Acad Med Sci USSR, Moscow

Submitted : 18 Jan 1955

GINDIN, A. P., and FORSHTER, Kh. K.

"Concerning the Pathogenesis of Atypical Forms of Infectious Processes Arising After Treatment With Antibiotics." Proceeding of Inst. Epidem Microbiol im. Gamaleya 1954-56.

Laboratory of Microbiology, Timkov, V. D.. professor, Active Member, Academy of Medical Sciences USSR, head, Inst. Epidem and Microbiol.im. Gamaleya AMS USSR

SO: Sum 1186, 11 Jan 57.

GINDIN, A. P., and KALIFINA, T. A.

"Morphological Characteristics of the Cutaneous Tularemia Reaction"
[Note: Kalitina, T. A., has been associated also with the Tularemia
Laboratory.] Proceedings of Inst. Epidem and Microbiol im. Gamaleya
1954-56.

Laboratory of Microbiology, Timakov, V. D., professor, Active Member,
Academy of Medical Sciences USSR, head, Inst. Epidem and Microbiol im.
Gamaleya AMS USSR.

SO: Sum 1186, 11 Jan 57.

USSR/Human and Animal Physiology - (Normal and Pathological). T-4
Blood. Blood Diseases.

Abs Jour : Ref Zhur - Biol., No 11, 1958, 50742

Author : Gindin, A.P., Ogiyenko, N.M., Lyutikova, O.G.,
Statkevich, I.A.

Inst : -

Title : The Siderocytes of the Peripheral Blood in Viral Anemia.

Orig-Pub : Byul. experim. biol. i meditsiny, 1956, 42, No 9, 20-21.

Abstract : Syderocytes (which are macrocytes containing hemosiderin) were not found in the blood of 30 normally kept healthy horses, nor were they found in the blood of another 26 healthy horses (producers of therapeutic sera), who were tested after they had given the usual blood donation. In the majority of the cases, siderocytes were found in the blood of horses suffering from infectious anemia, a fact which proves that a disturbance of Fe metabolism exists. The appearance of hemosiderin containing erythrocytes

Card 1/2 *Pathomorphology Lab, Inst Epidemiology, Microbiology
in N. F. Dumelija AMS USSR*

USSR/Human and Animal Physiology - (Normal and Pathological). T-4
Blood. Blood Diseases.

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00051

Abs Jour : Ref Zhur - Biol., No 11, 1958, 50742

in the peripheral blood serves as an important diagnostical symptom for infectious (viral) anemia existing in horses. -- N.M. Otsep.

Card 2/2

GINDIN, A.P., OGIYENKO, N.M.

Ribonucleic acid in cells of peripheral blood [with summary in English]. *Biul. eksp.biol. i med.* 46 no.8:62-64 Ag '58 (MIRA 11:10)

1. Iz Instituta epidemiologii i mikrobiologii imeni N.F. Gamalei (dir. prof. S.N. Muromtsev) AMN SSSR, Moskva, Predstavlena deystvitel'nyy chlenom AMN SSSR G.V. Vygodchikovym. .

(NUCLEIC ACID, in blood
in cells of peripheral blood of horses (Rus))

(BLOOD CELLS, metab.
ribonucleic acid in cells of peripheral blood of horses
(Rus))

(BLOOD CELLS, metab.
ribonucleic acid in cells of peripheral blood of
horses (Rus))

GINDIN, A.P.; OGIIYENKO, N.M.

Lymphocytic ribonucleic acid in the peripheral blood during intense antitoxic immunogenesis. Zhur.mikrobiol.epid. i immun. 30 no.2:94-98 P '59. (MIRA 12:3)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.
(RIBONUCLEIC ACID, in blood,
lymphocytes, during immunogenesis (Rus))
(VACCINES AND VACCINATION,
ribonucleic acid in lymphocytes during immunogenesis
(Rus))

MUROMTSEV, S. N. [deceased]; GINDIN, A. P.; ANOSOV, I. Ya.; MAYOROVA,
G. F.; BORODIYUK, N. A.

Morphological characteristics of the reaction of the body to
inhalation immunization with bacterial antigens. Report No. 1:
Morphological characteristics of pulmonary reactions to inhala-
tion revaccination with diphtheria antitoxin and whooping
cough vaccine. Zhur. mikrobiol., epid. i immun. 32 no.8:7-12
Ag '61. (MIRA 15:7)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei
AMN SSSR.

(DIPHTHERIA) (WHOOPING COUGH) (LUNGS)
(IMMUNITY)

GINDIN, A.P.; OGIYENKO, N.M.; USHAKOVA, A.V.

Ribonucleic acid in the blood lymphocytes in adrenaline
lymphocytosis. Biul. eksp. biol. i med. 54 no.9:62-64
S. '62. (MIRA 17:9)

1. Iz Instituta epidemiologii i mikrobiologii imeni N.F.
Gamalei (dir.- prof. P.A. Vershilova) AMN SSSR, Moskva.
Predstavleno deystvitel'nym chlenom AMN SSSR. G.V.
Vygodohikovym.

GINDIN, A.P.; OGIYENKO, N.M.

Ribonucleic acid in the blood lymphocytes of rabbits.

Tsitologiya 4 no.6:689-691 N-D'62 (MIRA 17:3)

1. Patomorfologicheskaya laboratoriya Instituta epidemiologii
i mikrobiologii AMN SSSR, Moskva.

SEABECK, G.Y.; LUDIN, G.P.; LYUBIKOVA, L.P.; ZHAROVA, A.V.

Original aspects and laboratory diagnosis of Rinderpest in horses producing therapeutic herd. *Vet. J. Syr. Acad. Sci.* 1963. (MIRA 18:8)

1. Treatment epidemiological effects of Rinderpest in horses. *AMN SSCR.*

GINDIN, A.P.; ANOSOV, I.Ya.; MAYOROVA, G.F.

Histopathology and histochemistry of the reaction of lymphoid organs to inhalation immunization with pertussis vaccine. Zhur. mikrobiol., epid. i immun. 40 no.3:45-49
Mr '63. (MIRA 17:2)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

L 62497-65 EWA(j)/EWT(1)/EWA(b)-2 JK

ACCESSION NR: AP5020091

UR/0016/65/000/008/0043/0050
616.981.455-092 : 612.017.1

AUTHOR: Savel'yeva, R. A.; Gindin, A. P.

18
17

TITLE: Pathogenesis of tularemia in immune and non-immune animals

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 8, 1965, 43-50

TOPIC TAGS: tularemia, immunology, vaccine

ABSTRACT: Inoculation of guinea pigs immune to tularemia with a virulent strain of the causative agent resulted in a benign infectious process with limited multiplication of the causative agent in various organs. The formation of granulomas in the experimental animals was characterized mainly by productive inflammation and, unlike the control, the granulomas did not become necrotic. The infectious process in guinea pigs inoculated with low doses (10 microbial cells) was generally restricted to the inoculation site and regional lymph nodes, but in animals inoculated with massive doses (10 million microbial cells), the process spread beyond them to the viscera. The main difference between the immune and non-immune animals was that in the latter the phase of hematogenic dissemination and focal spread of the infection

Card 1/2

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ACCESSION NR: AP5020091

developed into septicemia followed by death of the animals. In the immune animals, however, the phase of hematogenic dissemination and focal spread turned into the phase of extinction of the infection, and the animals recovered. There was an almost complete correlation between the dynamics of spread of the causative agent, phases of the infectious process, and pathological changes in various organs and tissues. Orig. art. has: 3 figures.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR
(Institute of Epidemiology and Microbiology, AMN SSSR)

SUBMITTED: 01Apr64

ENCL: 00

SUB CODE: LS

NO REF SOV: 010

OTHER: 000

776
Card 2/2

GINDIN, A. Sh.

S/133/63/000/004/005/011
A054/A126

AUTHORS: Meandrov, L. V., Golovanenko, S. A., Bykov, A. A., Myagkov, A. P.,
Korotkevich, B. M., Borisov, A. N., Kossovskiy, L. D., Gindin, A. Sh.

TITLE: Experimental rolling of bimetal sheets

PERIODICAL: Stal', no. 4, 1963, 343 - 346

TEXT: Tests were carried out at the Chelyabinskii metallurgicheskiy zavod (Chelyabinsk Metallurgical Plant) with the participation of N. P. Shohukin, V. D. Nikitin, S. A. Zuyev, V. P. Nikitin, N. N. Danilovich, N. V. Zerchaninov, V. V. Shturts, V. A. Ustimenko, V. V. Silant'yev, to establish the technology of bi-metal sheet production. Symmetric (4-layer, 150 - 220 mm thick) and asymmetrical (3-layer, 135 mm thick) sheets were produced. The nickel coating was applied in some tests by the standard electrolytic method, in some tests, however, a new process was employed with a special apparatus, involving the melting of a 1.5-mm diameter nickel wire, which was thereupon applied to the sheet surface by pulverization. Prior to this the surface to be coated was shot-blasted. A 600 x 1,750 mm sheet could be coated by this process with a 40 μ thick nickel layer

Card 1/2

Experimental rolling of bimetal sheets

S/133/63/000/004/005/011
A054/A126

in 20 minutes. The new method proved more advantageous than the conventional one: it required less time and no pickling. The pulverizing apparatus is simple, inexpensive and easily adjustable to automation. After coating the bimetal sheets were welded air-tight on the perimeter and the end surfaces. The rolling tests were made on a 2,300-mm stand at Chelyabinsk by the standard method. The welding seams prevented warping and lamination of the bimetal sheets. The tightness and the strength of the seams depended on the surface quality of the stainless and carbon steels composing the sheet and on the assembly and welding of the sheet layers. The deformation of the various layers in rolling was not uniform. This deviation in deformation was characterized by an experimental coefficient that in case of 4 - 10 mm thick sheets depended in the first place on the metal grade of the coating layer, but was independent of the total reduction in the investigated range of deformations. For sheets of 0t.30H/St.3sp + X 18 H10T / Kh18N10T grades the average coefficient value was 0.94 - 0.96, for sheets of St.3sp + 1X 13/1Kh13 steel grades: 1.03 - 1.05. There are 4 figures and 1 table.

ASSOCIATION: TaNIICHM, Chelyabinskii NIIM (Chelyabinsk NIIM, GPMZ)

Card 2/2

GLADKOVSKIY, V.A.; GINDIN, A.Sh.; KOSOVSKIY, L.D.; POPOV, N.P.

Evaluation of the magnitude of residual stresses in surface
layers of a back-up roll. Zav. lab. 29 no.9:1128-1129 '63.

(MIRA 17:1)

1. Permskiy politekhnicheskiy institut.

IZRAILEVICH, M.L.; GINDIN, B.Ya.; LAZDAN, E.Ye.

Soot conveyors for rubber tire plants. Biul. tekhn.-ekon.
inform. Gos. nauch.-issl. inst. nauch. i tekhn. inform. 17 no.2:
14-17 '64. (MIRA 17:6)

GINDIN, B. Ya.

Introducing a small closed scraper conveyor with a cooled
bottom. Biul. tekhn.-ekon. inform. Gos. nauch.-issl. inst.
nauch. i tekhn. inform. 18 no. 12:56-58 D '65 (MIRA 19:1)

GINDIN, D.A.

Medical electric humidity meters. Med.prom. 15 no.9:56-89 S '61.
(MIRA14:9)

1. Mediko-instrumental'nyy zavod "Krasnogvardeyets".
(WATER IN THE BODY) (PHYSIOLOGICAL APPARATUS)

S/582/61/000/005/005/012
D222/D306

AUTHOR: Gindin, D. G. (Moscow)

TITLE: On the control of chemical reactions

SOURCE: Problemy kibernetiki, no. 5, Moscow, 1961, 97-103

TEXT: This paper is a general discussion of some ideas that may be relevant to the automation of processes in the chemical industry. The basic ideas of this paper were reported and discussed at a seminar at the Vsesoyuznyy institut aviatsionnykh materialov (All-Union Institute of Aviation Materials) in 1946, under the leadership of Ya. I. Frenkel', now corresponding member of the Academy of Sciences USSR. The author argues that there is a need to establish a branch within cybernetics to deal with the specific problems arising in chemistry. The main purpose of "chemical cybernetics" would be to construct devices for the automatic control of chemical processes, using sensing elements and information processing units. At present, however, the most important problem is the algorithmization of chemical processes, i.e. the construction

Card 1/3

On the control of chemical ...

S/582/61/000/005/005/012
D222/D306

of logical schemes for the kinetic, technological and other properties, and the construction of "chemical" algorithms. Two kinds of factors are distinguished that can influence the course of the processes: Internal (those which originate in the physico-chemical properties of the reacting substances), and external (those originating in the environment of the reaction, i.e. temperature, etc.). The author concentrates on the internal factors. It is suggested that the dispersion of results, observed even with seemingly rigorously controlled uniform conditions, is due to the fact that the experimental specimens have a kind of individual nature due to the complexity of their physico-chemical structure. Small fluctuations in these properties can give rise to either a convergent or divergent tendency in the results. Examples of processes where such an individual nature of specimens is found are the corrosion of metals, electrochemistry, chemical kinetics, semiconductors, strength of materials, and so on. There are 8 references: 2 Soviet-bloc and 6 non-Soviet-bloc. The references to the English-language publications read as follows: N. Wiener, Cybernetics, 1958; W. R. Ashby, Introduction to Cybernetics, 1959.

Card 2/3

GINDIN, D.Ye., inzh.

Increasing the speed and reliability of feed mechanisms.
Mekh. i avtom. proizvod. 19 no. 10:13-15 0 '65. (MIRA 18:12)

GAPCHENKO, P., invalid Otechestvennoy voyny (g. Kiyev); GINDIN, G.,
invalid Otechestvennoy voyny (g. Kiyev); SAVINSKIY E., invalid
Otechestvennoy voyny (g. Kiyev); KOLODOCHKA, B., invalid
Otechestvennoy voyny (g. Kiyev); KHOVANSKIY, A., invalid
Otechestvennoy voyny (g. Kiyev).

Bring order into the organization of motor wheelchair repair.
Prom.koop. no.6:24 Je '57. (MLRA 10:7)
(Orthopedic apparatus)

S.C. L. GINDIN, I.A.

35. Synth. Rub. & Allied Products

Mechanism of the simultaneous polymerisation of butadiene with vinyl cyanide and 1-methylvinyl cyanide under the action of benzoyl peroxide. L. GINDIN, A. AKBIN, and V. MIRONOV. *J. Phys. Chem.*, USSR, 1947, 21, 1260-87; *Chem. Abstr.*, 1948, 42, 6715b. Mixture of butadiene with vinyl cyanide or 1-methyl vinyl cyanide and benzoyl peroxide were prepared in nitrogen, heated, and distilled in high vacuum 20 hr. The distillation residue which is the polymer was analysed for nitrogen and active oxygen. With vinyl cyanide the rate of polymer formation decreases as the ratio of butadiene increases at 60°. During one experiment rate of formation was almost constant for small butadiene percentage and increases with time at large percentage. Rate of polymer formation increases with temperature. The rate is proportional to the square root of the % of benzoyl peroxide

between 0.3 and 10 wt. %. The highest yield of polymer over 83% was observed when % butadiene was 50. In the case of the 1-methylvinyl monomer the highest yield was obtained when butadiene content was 40%. The concentration of benzoyl peroxide decreases in the polymer as temperature increases, but polymerisation continues after this is zero. Monomer distilled from polymer and mixed with it again polymerises at same rate as before, but solution and reprecipitation of the polymer removes its catalytic activity. In the butadiene vinyl cyanide polymer 67% of vinyl cyanide is present as one nitrile group between two butadiene groups. In the other polymer the 1-methyl vinyl cyanide group is in a similar position.

352MDN21 12212

1948

PA 165734

USSR/Metals - Bismuth
Twinning

Aug 50

"Twinning in Bismuth," I. A. Gindin, V. I. Startsev, Physicotech Inst, Acad Sci Ukrainian SSR

"Zhur Ekspier i Teoret Fiz" Vol XX, No 8, pp 738-741

Describes process of formation and propagation of twinned layers in monocrystalline bismuth under action of concentrated loads. Observes similarity of twinning processes in metallic and ionic monocystals. Shows presence of two yield points in twinning of bismuth monocystals. Studies influence

165734

USSR/Metals - Bismuth (Contd)

Aug 50

of annealing upon state of twinned layers. Show retrogressive twinning occurs in bismuth. Submitted 9 Feb 50.

165734

GINDIN, I. A.

GINDIN, I. H.

USSR :

#2
Annealing twinned crystals of iron R. I. Garber, I. A. Gindin, M. G. Konstantinovskii and V. I. Startsev (Phys. Tech. Inst., Acad. Sci. Ukr. S.S.R., Kharkov). *Doklady Akad. Nauk S.S.S.R.* 74, 243-4 (1950).—Specimens of C-free steel were annealed at 300° for 3 hrs., elongated 2-3%, then annealed 8 days, increasing the temp. gradually from 400 to 550° to give an av. grain size of 1.5-2 mm. The specimens were then broken under tension at temp. of liquid N, forming twinned crystals in grains near the fracture. Twinned layers began to disappear after 10 hrs. annealing at 850°, and all had disappeared after 55 hrs. at 850° followed by 60 hrs. at 600°. H. W. Rathmann }

GINDIN, I. A.

USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline
Compounds, E-9

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34862

Author: Garber, R. I., Gindin, I. A., Kogan, V. S., Lazarev, B. G.

Institution: None

Title: Investigation of Plastic Properties of Beryllium Monocrystals

Original Periodical: Fiz. metallov i metallovedeniye, 1955, 1, No 3, 529-537

Abstract: transition of the Be monocrystal into a fully-twinned state is related to the process of mechanical twinning in the (102) plane, and is particularly easy to effect at 400° and above. In addition to the principal system of twins along (102), one observes also twins in the (101) and (103) planes. The mechanism of slipping of Be depends substantially on the temperature and orientation of the specimen. In some specimens, base slipping is observed even at -196°. The plasticity of Be, which increases monotonically with temperature, reaches a maximum at 400° ($\delta = 26\%$) and diminishes somewhat at 600°, and increases again at 800°. The mechanical characteristics of the plasticity of monocrystals of beryllium are determined, and their dependence on temperature. The yield point when slipping along the (100) and (101) planes diminishes by approximately 4 times when heated from 200 to 800°.

~~2 of 2~~

- 2 -

GINDIN, I.A.

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Crystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6787

Author : Garbor, R.I., Gindin, I.A., Kogan, V.S., Lazarev, B.G.
 Inst : Physico-Technical Institute, Academy of Sciences, Ukraine SSR
 Title : X-ray Investigation of the Elasticity of Single Crystals of Beryllium

Orig Pub : Izv. AN SSSR, ser, fiz., 1956, 20, No 6, 639-640

Abstract : X-ray diffraction, metallography and micro-interferometry have been used to investigate single crystals of beryllium, cut in the form of rectangular parallelepipeds, with one of the faces aligned with the plane of the base. The specimens were deformed by unilateral compression at temperatures from -253 to 800°. The results of the investigations are summarized in a table.

Card : 1/2

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Crystalline Compounds E-9

APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R0005

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6787

Abstract: Character of Plasticity & Its Elements

Orientation of Single Crystal	Mechanical Twining	Total Reorientation; symmetry plane (102)	Slippage
Binary Axis \perp 100 perpendicular to compression axis		400° plus	400/ 200/ 800° 800° in in ó- twin rig. ro- sin- gion.glo
Binary Axis \parallel 100 parallel to compression axis	400° plus	400° plus	Room temp & above -196/ 800° in twin region crys- tal

Card : 2/2

GINDIN, I.A.

SUBJECT USSR / PHYSICS

CARD 1 / 2

PA - 1479

KOGAN, V.S., LAZAREV, B.G.

Dokl. Akad. Nauk, 110, fasc. 1, 64-66 (1956)

CARD 2 / 2

PA - 1479

by subsequent heating up to room temperature. A similar structural change is found in iron samples after rolling in liquid nitrogen, but in this case the degree of refinement is higher than on the occasion of pressing the ball through the tube. The degree of refinement in iron and nickel after treatment at low temperatures followed by heating to 20° depends on the size of grain of the initial structure as well as on the degree of deformation. For the production of microdistortions the initial stages of deformation are of importance at low temperatures, on which occasion the work performed by exterior forces goes over nearly entirely into the latent deformation energy. On the occasion of deformation (beginning with an 8% deformation) as a result of pressing a ball through a tube micropores are produced, a process which may be connected with mechanical twin formation. In all the cases of recrystallization at low temperatures investigated on this occasion, deformation was brought about by the formation of creeping stripes either in a pure form (nickel) or in connection with twin formation (iron).

INSTITUTION: Physical-Technical Institute of the Academy of Science in the USSR.

GINDIN, I. A.

126-2-17/33

AUTHORS: Gindin, I. A., and Kogan, V. S.

TITLE: State of the surface layer of a single zinc crystal after grinding and annealing. (Sostoyaniye poverkhnostnogo sloya monokristalla tsinka posle shlifovki i otzhiga).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.2, pp. 326-330 (USSR)

ABSTRACT: In earlier work of the authors (Ref.3), it was found that work hardening caused by grinding activates diffusion processes which then may become very intensive even at room temperature. It was, therefore, considered of interest to machine such specimens and make X-ray exposures of these under conditions such that these processes are either completely eliminated or at least appreciably reduced. For that purpose zinc monocrystals were ground along their cleavage planes at the temperature of liquid nitrogen (-196°C) and X-ray patterns taken directly after grinding, prior to heating them to room temperature and after "annealing" at room temperature and at 100, 150 and 200°C . Comparison of the structure of the surface layer of zinc specimens ground at -196°C with those ground at room temperature enabled elucidation of the influence of Card 1/3 the mechanical properties on the processes taking place

120-5-11111
State of the surface layer of a single zinc crystal after grinding and annealing.

in the specimen during grinding. As a result of annealing of the specimens, certain details were detected in the state of the lattice of the surface layer of the specimens after grinding, which were not detected in previous experiments, during which the specimens were work hardened and subsequently investigated at room temperature without any heat treatment. It was found that the surface layer of the monocrystal breaks up into fine grains which are disorientated more strongly in specimens for which the work hardening was effected at the liquid nitrogen temperature. The annealing does not re-establish the monocrystal nature in the surface layer and leads to recrystallization with grain growth towards the depth of the monocrystal. Under the recrystallized zone there is a layer in which the monocrystal consists of blocks with orientations approaching the initial orientation and the depth of these layers increases with the annealing temperature. In crystals deformed at the temperature of liquid nitrogen and annealed at 200°C, the non-distorted monocrystal was detected only after etching to a depth of 300μ. In crystals deformed at room temperature and

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and annealing.

subsequently annealed, the depth of the distorted zones
was greater still. X-ray patterns and micro-photographs
are included.

There are 4 figures and 7 references, 5 of which are
Slavic.

SUBMITTED: April 16, 1956 (Initially), December 18, 1956 (after
revision).

ASSOCIATION: Physico-Technical Institute Ac. Sc. Ukrainian SSR.
(Fiziko-Tekhnicheskii Institut AN USSR).

AVAILABLE: Library of Congress.

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GINDIN I. A.
GARBER, R. I., GINDIN, I. *A.* and POLYAKOV, L. M.

"Fractioning and Sintering of Microblocks during the Plactical
Deformation of Crystals."

paper presented at the Conf. on Mechanical Properties of Non-Metallic Solids,
Leningrad, USSR, 19-26 May 58.

Physical-Technical Institute of the Ukrainian Academy of Sciences, Kharkov.

AUTHORS: Gindin, I. A., Khotkevich, V. I. and Starodubov, Ya. D. SOV/126--7-5-25/25

TITLE: Investigation of the Plastic Properties of Aluminium at Low Temperatures (Issledovaniye plasticheskikh svoystv aluminiuma pri nizkikh temperaturakh)

PERIODICAL: Fizika metallov i metallovedeniye, Vol 7, Nr 5, pp 794-800 (USSR) 1958

ABSTRACT: Pure aluminium (99.994% Al) and technical aluminium containing up to 1% impurities (Si, Mn, Fe) were used for the investigation. The specimens were in the shape of plates of 2.5 x 2.5 mm cross-section and 17 mm working length, widening at the ends for ease of gripping in the testing machine. After grinding and polishing, all specimens were annealed in vacuum for one hour at 300°C. The average linear grain size in pure aluminium was 1.0 to 1.5 mm, and in technical aluminium 0.3 to 0.5 mm. Deformation was carried out in a vertical-type tensile testing machine using mechanical loading, being specially adapted for low temperature work. Tensile tests were carried out at 293, 77, 20, 4.2, 2.06 and 1.4°K. In this apparatus it was possible to carry out tensile and compression tests in liquid hydrogen as well as

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in liquid helium at 4.2°K and below. A temperature of less than 4.2°K was obtained by evacuating helium. The layout of the apparatus is shown in Fig.1. A study of the macro- and microstructure of fractured specimens has shown that the nature of plastic deformation of aluminium changes fundamentally with change in temperature from 20°K to 4.2°K and below. Fig.2 shows the microstructure of an aluminium specimen (99.994%), fractured at 20°K . Fig.3 shows the microstructure of a similar specimen fractured at 4.2°K . In Fig.4 the macrostructure of aluminium specimens (99.994% Al) fractured at 20°K (a) and 4.2°K (b) is shown. In Fig.5 load-extension curves for cylindrical specimens of technically pure aluminium of 3 mm diameter (annealed at 300°C for one hour, grain size 0.3 mm) are shown for various temperatures. In Fig.6 load-extension curves for flat pure aluminium specimens of 2.5×2.5 mm section (annealed at 300°C for one hour, grain size 1-1.5 mm) are shown for various temperatures. Fig.7 shows load-extension curves for specimens of technically pure aluminium at 4.2°K after various preliminary treatments. In Fig.8 a micro-interference picture of the polished surface of a pure aluminium specimen, deformed at 1.4°K , is shown.

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Fig.9 is a photomicrograph of the polished surface of a pure aluminium specimen deformed at 1.4°K . The deflection of a scratch at the boundary of large blocks is visible. Fig.10 shows the deflection of interference lines at the boundary of large blocks of a pure aluminium specimen deformed at 1.4°K . In Fig.11 the dependence of the mechanical properties of aluminium on temperature in the range 1.4 to 293°K is shown. The authors arrive at the following conclusions:

1. It has been found that a sharp difference exists in the macro- and microscopic nature of plastic deformations of specimens of pure aluminium if the temperature at which they are strained is changed from 20 to 4.2°K and below. A lowering in the temperature of testing leads to an intensification of the inhomogeneity of plastic deformation; i.e. to the formation of large blocks the sizes of which exceed those of the average metal grain.

2. The plastic deformation of aluminium at 4.2°K and below is characterized by an unstable flow which is expressed the more clearly, the lower the testing temperature. Preliminary cold working of the specimens intensified the interrupted

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nature of flow.

3. At 4.2°K and below the formation of mechanical twins is observed in aluminium. It is possible that the instability of plastic flow is associated with the formation of mechanical twins.

4. The mechanical properties of aluminium in the temperature range 77-1.4°K have been determined. It has been found that the true strength of specimens of pure and technical aluminium tested to fracture at 4.2°K are close to one another. The ultimate tensile stress σ_s is practically independent of temperature. The residual elongation has a maximum in the range 20 to 4.2°K. There are 11 figures and 9 references, of which 6 are Soviet and 3 English.

ASSOCIATION: Khar'kovskiy fiziko-tekhnicheskij institut AN USSR
(Khar'kev Physico-Technical Institute AS Ukr.SSR)

SUBMITTED: March 12, 1958

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USCOMM-DG-61,699

18(0)

AUTHORS:

Gindin, I. A., Lazarev, B. G.,
Starodubov, Ya. D., Khotkevich, V. I.

SOV/56-35-3-46/61

TITLE:

The Low-Temperature Polymorphism of Metals
(Nizkotemperaturnyy polimorfizm metallov)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol 35, Nr 3, pp 802 - 804 (USSR)

ABSTRACT:

In the present paper (unlike the practice adopted by several earlier papers dealing with the same subject) the method of mechanical tests is used, in which the compression diagram of lithium, sodium, cesium, bismuth, and beryllium samples with subsequent heating are investigated. Also the variations of volume in inverse transformation are recorded. These tests were carried out on a one-ton machine with a rigid dynamometer, which is suited for carrying out measurements at helium temperatures. The velocity of deformation was constant and amounted to 0,03 mm/sec. A graph gives a typical diagram of the deformation in the coordinates "stress - absolute compression" for lithium. At 77°K this is the melting curve with consolidation of the shape at high degrees of deformation. There are no singular points indicating a

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The Low-Temperature Polymorphism of Metals

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transformation. If the deformation temperature drops to 20°K and less (down to $1,4^{\circ}\text{K}$), a characteristic discontinuity is observed on the curve with a sharp decrease of resistivity against deformation. The most direct proof of the polymorphous transformation in the tests discussed are the variations of volume in inverse transition while the deformed sample is being heated. Similar curves were obtained also for sodium. In the case of cesium no polymorphous transformation is observed on the deformation diagram even at $1,4^{\circ}\text{K}$. Nevertheless, the shape of the curve of heating allows us to conclude that, to a small extent, such a transformation actually exists. This behavior of the three alkali metals is apparently connected with the reduction of characteristic temperature and leads to the conclusion that polymorphism exists in the entire group of alkali metals. The discontinuity of stress in the compression diagram is observed also in the case of beryllium at temperatures of $4,2^{\circ}\text{K}$ and less. All this seems to indicate an extensive occurrence of low-temperature polymorphism, which is observed in the case of tin, sodium, lithium, cesium, bismuth, and beryllium. There are 2 figures and 6 references, 4 of which are Soviet.

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The Low-Temperature Polymorphism of Metals

SOV/56-35-3-46/61

ASSOCIATION: Fiziko-tekhnicheskii institut Akademii nauk Ukrainskoy SSR
(Physico-Technical Institute of the Academy of Sciences,
Ukrainskaya SSR)

SUBMITTED: June 7, 1958

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GINDIN, I.A.

SCV/2395

FRASE I BOOK EXPLOITATION

24(6)

Abstraktya nauk SSSR

Abstracts of the Scientific Works of the USSR Academy of Sciences (Some Problems in the Strength of Solids) Collection (Articles) Moscow, Izd-vo AN SSSR, 1979. 586 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V. I. Aver'yanov; Tech. Ed.: R. S. Rymer; Editorial Board: A. F. Lotko, Academician G. V. Kur'yumov, Academician S. N. Zhurav, Corresponding Member, USSR Academy of Sciences; B. P. Vitman, Corresponding Member, USSR Academy of Sciences; Ed.: I. A. Gindin, Doctor of Physical and Mathematical Sciences, Professor (Res.); G. A. Gindin, Doctor of Technical Sciences, Professor; S. A. Gindin, Doctor of Physical and Mathematical Sciences; V. A. Serebreny, Doctor of Technical Sciences; Ya. B. Fridman, Doctor of Technical Sciences, Professor; B. S. Ioffe, Candidate of Technical Sciences (Deputy Rep. Ed.).

PURPOSE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

COVERAGE: This collection of articles was compiled by the Oldenkye Institute of Mathematics and Mechanics of the USSR Academy of Sciences (Institute of Applied Physics) and the Priblino-Tekhnicheskii Institut AN SSSR (Institute of Applied Physics, Academy of Sciences, USSR) in commemoration of the 50th birthday of Nikolay Nikolayevich Davidenko, Member of the Ukrainian Academy of Sciences, Founder and head of the Department of Applied Physics (Department of the Strength of Materials) of the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Institute of Applied Physics (Department of Applied Physics) at the Leningradskiy politekhnicheskii Institut (Leningradskiy Tekhnicheskii Institut), recipient of the Stalin Prize (1953), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1955). The book is devoted to the strength of materials, phenomena of imperfect plasticity, temper brittleness, hydrogen embrittlement, cold brittleness, influence of metals, and action speed on the mechanical properties of materials, and mechanical properties of general problems of the strength, plasticity and mechanical properties of materials. Numerous personalities are mentioned in the introductory profile of Professor Davidenko. References are given at the end of each article.

41 Gindin, I.A., B.G. Lazany, Ya.D. Kuznetsov, and V.I. Kostyevich (Leningradskiy Institut Prikladnoi Fiziki, Institute of Applied Physics, Academy of Sciences (Ukr. SSR, Khark'ov). Low-temperature Polymorphism of Metals

46 Zhurav, S.N., and E.Ye. Zvezdovskiy (Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Time Dependency of Strength Under Different Load Conditions

47 Kuznetsov, Ya.D., T.I. Gulyaeva, A.A. Zvezdovskiy, and S.T. Kibikhin (Leningradskiy Institut Prikladnoi Fiziki, Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Influence of Stresses and Deformation on the Process of Diffusion

48 Gindin, I.A., and A.L. Kimanin (Gosudarstvennyy universitet imeni Gorkogo, Gorkovskiy Gosudarstvennyy Universitet imeni Gorkogo, Diffusion Creep of Strain Specimens Pressed From Powdered Iron

49 Strukova, V.I., and E.S. Yakovleva (Institut fiziki metallov Ural'skogo nauchno-issledovatel'skogo tsentra, Ural Branch, Academy of Sciences, USSR, Sverdlovsk). Influence of Aluminum and Copper on the Deformation of Nickel

50 Kostov, Z.A. (Institut popovredimivostei AN SSSR, Leningrad-Gos. Institut Prikladnoi Fiziki, Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Relationship Between the Mechanical and Thermal Characteristics of Crystals

51 Gindin, I.A., and I.I. Solovchenko (Gosudarstvennyy pedagogicheskii Institut imeni G.E. Morozova, Khark'ov-Gos. Pedagogical Institute imeni G.E. Morozova, Khark'ov). Strengthening of Rock Salt Crystals by Measured Reverse Strain

52 Gindin, I.A., and V.A. Pavlov (Institute for Metal Physics, Ural Branch, Academy of Sciences, USSR, Sverdlovsk). Some Aspects of Stress Relaxation in Bronze Bz₂Z-1

53 Troshchallo, S.O., and Z.A. Vashchenko (Polytechnic Institute imeni M.I. Kalinina, Leningrad). Increasing the Elastic Limit and Decreasing the Elastic Aftereffect During Cold Hardening and Tempering of Spring Aluminum Bronze Bz1

54 Gindin, I.A., and E.K. Golovkin (NII po pererabotke vertikal'nykh i polucheniya i razresheniya shirokogo diapazona, Gos. Leningradskiy nauchno-issledovatel'skiy tsentr po petroliumskomu delu i proizvodstvu sinteticheskogo likvidnogo fuela, Leningrad). Nature of the Physical Yield Point of Steel

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GINDIN, I.A.; STARODUBOV, Ya.D.

Low temperature plastic breakdown of large-grain iron. Fiz.tver.
tela 1 no.12:1794-1800 D '59. (MIRA 13:5)

1. Fiziko-tekhnicheskiy institut AN USSR, Khar'kov.
(Iron--Metallography)
(Deformations (Mechanics))

GARBER, R.I.; GINDIN, I.A.; STARODUBOV, Ya.D.

Thermal hardening of twinned layers of iron crystals. Fiz.tver.
tela 1 no.12:1801-1805 D '59. (MIRA 13:5)

1. Fiziko-tehnicheskij institut AN USSR, Khar'kov.
(Iron--Heat treatment)

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SOV/126-8-1-18/25

AUTHORS: Garber, R. I., Gindin, I. A., Kovalev, A.I. and Shubin, Yu. V.

TITLE: Study of the Plastic Properties of Monocrystals of Beryllium. II.

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 1, pp 130-139 (USSR)

ABSTRACT: In the present paper slip processes in monocrystals of beryllium which have not been submitted to preliminary twinning have been studied and the relationship between slip and fracture of beryllium in the white temperature range has been established. Specimens were made from monocrystals of a beryllium block grown by slow cooling of the melt in vacuum. The purity of the original material was 99.7%. Cutting of the block was carried out by an electro-corundum disk on a grinding machine. The worked layer was removed by etching the beryllium with an aqueous solution of hydrofluoric acid. The specimens had the shape of a rectangular prism, 3.5 x 4.0 x 7.0 mm. All prism facets were ground. Two side faces (3.5 x 7.0 mm - type-a face and 4.0 x 7.0 mm - type-b face) were polished. From the Lauegrams it was evident that the crystals were undistorted. The experi-

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ments were carried out under conditions of compressive deformation on a special press (Ref 6) at a constant deformation rate (0.03 mm/sec) at temperatures of -253, -196, 20, 400, 600 and 800°C. The specimens were orientated in such a way that the basal plane (0001) made an angle of $45 \pm 1.5^\circ$ with the axis of the compressive forces (Fig 1). The side face of the specimen was parallel with the crystallographic plane of the primary prism (1100) and subsequently also parallel to the primary diagonal $[1120]$. The metallographic and X-ray methods used for the studies have been described earlier by Garber et al. (Refs 1,7). Indexing of the exposed elements of plasticity and fracture was carried out according to the traces of deformed bands and cracks on previously polished specimen faces. The results were plotted on a standard stereographic projection of the basis plane of the crystal. An X-ray analysis method was used for the orientation of specimens and for the supplementary control of elements of slip and fracture. The structure of the bands of basal slip was studied also electronmicroscopically. In Fig 2 traces of slip occurring in monocrystals of beryllium at

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various temperatures are shown schematically. Photomicrographs of the surface of specimen faces after compression at 20°C are shown in Fig 3a and b and the micro-interference picture of the relief of these surfaces in Fig 3b and 2. The slip bands have been resolved electronmicroscopically as slip packets. At -196 and +20°C the thickness of the packet is the same, namely 0.1-0.3 μ (Fig 4). The magnitude of slip can be estimated from the displacement of a scratch intersecting the trace of the slip band in a type-b face (Fig 5). In Fig 6 compression curves for monocrystals of beryllium (curves for various slip temperatures along the abscissae axis) are shown. 1 mm along the abscissae axis corresponds to 60 μ deformation; 1 mm along the ordinate axis corresponds to a load of 18 kg. Fig 7 shows the temperature dependence of the mechanical characteristics of monocrystals of beryllium: σ_s - yield stress in compression; σ_b - UTS in compression; δ - total residual compression; δ_s - residual compression prior to the appearance of the first slip bands. Fig 8 shows the prismatic slip in monocrystals of beryllium: a - slip trace in a type-a face. Compression at 20°C by

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Study of the Plastic Properties of Monocrystals of Beryllium. II.

1.2%; X 10 000; b - trapeze-like slip trace in a type-a face. Compression at 400°C by 1.5%, X 432. Fig 9 shows photomicrographs of cross-sectional microcracks formed as a result of non-uniformity of shift in the slip along the slip bands. Fig 10 shows slip traces of a polygonized monocrystal of beryllium. The slip planes are wavy; polygonization blocks can be seen. The treatment consisted in compression by 0.6% at 20°C, annealing at 800°C for 3 hours, followed by repeated compression by 0.8% at 20°C, X 8000. The table on p 137 shows the crystallographic elements of slip, twinning and fracture and the temperature region in which they occur. Fig 11 is a standard stereographic projection of the basal plane (0001) of a monocrystal of beryllium. The orientation of monocrystals of beryllium is shown in Fig 12. The authors arrived at the following conclusions:

1. The essential aspect of plastic deformation of beryllium in a wide temperature range (-196° to +800°C) is slip along the base (0001) in the direction $[1120]$.

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The slip in beryllium differs fundamentally from that in

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other hexagonal crystals. Beryllium has a large number of different crystallographic twinning systems. Mechanical twinning is not responsible for the great brittleness of beryllium. Re-forming of twins within an entire crystal leads to an increased plasticity and strength of the crystal in subsequent slip. An unevenness in movement along basal slip planes has been observed. This causes the formation of microcracks along prism and secondary pyramidal planes. Thus the brittleness of beryllium is associated with a large number of cleavage planes which are exposed particularly strongly because of the non-uniformity of slip at low temperatures.

There are 12 figures, 1 table and 13 references, 8 of which are Soviet and 5 English.

ASSOCIATION: Fiziko-tehnicheskii institut AN UkrSSR
(Physico-technical Institute, Ac.Sc., UkrSSR) 4

SUBMITTED: December 24, 1957
Card 5/5

24(2)

AUTHORS:

Garber, R. I., Gindin, I. A., Shubin, Yu. V. SOV/56-36-2-5/63

TITLE:

The Slipping of Beryllium Single Crystals at Low Temperatures III
(Skol'zheniye monokristallov berilliya pri nizkikh temperaturakh
III)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 2, pp 376-384 (USSR)

ABSTRACT:

This paper is a continuation of parts I and II (Refs 1, 2), in which the authors had investigated slipping along the basis plane (0001) of technically pure beryllium single crystals (99.7%) at various temperatures. The investigations described here were carried out with purer Be single crystals (99.98%) at 77 and 20°K. Further, slipping on (0001) under the influence of a deforming force forming an angle of 45° with the plane (0001) was investigated. The direction of displacement in the case of basic slipping was parallel to the lateral face of the investigated crystal - the diagonal of first order [1120]. Deformation was brought about by means of a machine which was especially constructed for operation at low temperatures (Refs 3, 4); the rate of deformation was 0.05 mm/sec. The character of slipping was found to be highly dependent on

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the stage of deformation. In the case of weak deformations, there is no immediate slipping along the strips, and displacement occurs in a thin layer resting against the strips. Thus, the part of the crystal between two strips is displaced as a whole. Residual stress causes elastic displacement of the opposite sign in the crystal layers resting against the strips. In the case of strong pressure slipping takes place along the strip, and strong relative displacement occurs. The formation of a saw-shaped profile of the crystal face is characteristic of this stage; this may, according to reference 8, be looked upon as a result of twinning on planes with large indices in the case of basic slipping. The discontinuity of displacement is explained as being due to the existence of impurities. Purification of the beryllium contributed towards rendering the course of displacement along each strip more continuous, which leads to a higher degree of plasticity. At 77°K the formation of whole packets of strips can be observed, which is very clearly shown by figure 7. The method of building up the face profile of deformed crystals makes it possible to determine the basic dimensions of the fine structure of the elementary slipping strips and of the packets. The twist noticeable between the

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strips can, in the first stage, be considered to be due to residual stress; this twist, which increases with deformation, must necessarily be explained in the advanced stage, when it attains 3° , as a result of twinning. In conclusion, the authors thank I. M. Fishman for constructing and producing the replicas and for making electron-microscopical recordings. There are 9 figures, 1 table, and 13 references, 10 of which are Soviet.

ASSOCIATION: Fiziko-tehnicheskii institut Akademii nauk Ukrainskoy SSR
(Physico-Technical Institute of the Academy of Sciences,
Ukrainskaya SSR)

SUBMITTED: July 16, 1958

Card 3/3

L. A. Gindin

807/53-67-4-7/7

11/0
AUTHOR:

Chentsov, R.
The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vesoyuznoye sovmestniye po fizike nizkikh temperatur)

PERIODICAL: Uspelhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Odelskaya fiziko-khimiya-akademicheskii nauki SSSR (Department of Physical-Mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, USSR), Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet (Tbilisi State University) in cooperation with the Conference Center of the USSR Academy of Sciences in Tbilisi. Moscow, Khar'kov, Kiev, Leningrad, Sverdlovsk and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered at present working in the USSR. About 50 lectures were delivered which were divided according to research fields.

Various Questions.
One of the most interesting lectures delivered at this Conference was that by L. A. GINDIN, R. G. Khar'kov, Ye. P. Shkol'nikov and V. I. Khokhlovich (GPII) on the polymorphism of metals at low temperatures; F. L. Kapitsa commented on this topic during the discussion. M. P. Balabaeva, V. S. Kozlov and B. G. Lazarev (GPII) investigated the system hydrogen-deuterium by the methods of low-temperature-radiography, thermal analysis, and the methods observed in V. Kuznetsov, R. I. Lashchenko, Sh. Kh. Mikhaylov and N. V. Ryzhikov. They investigated the thermodynamic properties of compounds of the type A_2B_2 and dealt with the phenomenon of the "photon wind" predicted by Gurevich; the investigation was carried out at the Magadan'skiy filial AN SSSR (Magadan Branch, AN SSSR). F. M. Reznov and A. P. Smirnov (LPI - Leningrad Physico-technical Institute) gave a report on the measurement of the electricity limit of tin- and indium polycrystals at very low temperatures (4 K), and N. K. Reznov and N. I. Krivko (LPI) spoke about attempts made to find the "reversed diamagnetism" in the system of the Ca^{2+} ions in CaF_2 crystals. (GPII Institute of High Pressure Physics, Tbilisi, USSR); the results of the investigation of the properties of the CaF_2 crystals and Leningrad Institute of Physics (Gruzinskaya SSR) carried out a theoretical investigation of the Overhauser effect in non-metals. Lomkade investigated the electron- and nuclear (proton) resonance in diphenylpicryl hydrazyl at helium temperature. B. E. Samojlov spoke about "steric" effects carried out concerning the orientation of Co^{2+} and Mn^{2+} nuclei (in iron) at extremely low temperatures. B. P. Akharcheraya and Ye. P. Geras (LPI) investigated the absorption spectrum of a cuprous oxide crystal in the magnetic field at helium temperature and observed the effect of the magneto-optical oscillations in the absorption spectrum of the crystal. The author carries scientific work of Soviet scientists in foreign countries (Sverdlovskaya nauchnaya komandirovka), and E. V. Shkol'nikov spoke about the abstracting journal "Fizika". The head of the department for problems of the physics of low temperatures, Academician P. L. Kapitza and the President of the Academy of Sciences Gruzinskaya SSR, Academician N. I. Bushel'shvil' closed the Conference. The 6. All-Union Conference on the Physics of Low Temperatures will be held in June and July 1959 in the city of Sverdlovsk.

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AUTHORS: Gindin, I. A., Starodubov, Ya. D.

TITLE: Slippage Along the Boundaries of Twins During Direct and Reciprocal Twinning of Iron

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1070 - 1081

TEXT: The present paper describes some peculiarities of deformation occurring in direct and reciprocal twinning of iron on the boundaries of these twins. It was the aim of the authors to find the cause of the different behavior of the interfaces under static load. Preceding papers (Refs. 1 and 2) have shown that the twin layer became thicker, and that one interface of the twin layer remained immobile, while the other was shifted. For their study, the authors used iron (degree of purity: 99.99%, grain diameter: 2 - 2.5 mm) which was annealed for five hours at 800° after polishing the boundary faces. A multistage deformation at the temperatures of liquid nitrogen was carried out on the samples with room-temperature heating in between. It was thus possible to observe the appearance and disappearance of the twin

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Slippage Along the Boundaries of Twins During
Direct and Reciprocal Twinning of Iron

double layer, as well as its boundary shift with increasing load. The deformation to be reached per deformation step was chosen from 0.1-0.5%. Changes were observed by the microinterferometric method with a microscope of the type MIM-4 (MII-4) and by variations arising in the etched lines. Experiments established that the lines suffer a break on compression and are displaced on a boundary plane. This displacement was likewise observed on the break of the interference stripes on one boundary. The displacement, however, did not increase with further increasing load. If the displacement was missing in the initial deformation stage (it could not be observed on all identical boundary layers of a twin system), it did no more arise on any further intensification of the deformation. It is concluded therefore that the slippage along the plane (112) must take place before the twin formation, i. e. while the lattice changes over to the twin formation. An "accomodation region" often forms besides the displacement on the slip plane. Still, one phenomenon does not necessarily entail the other. Slippage occurs in the direction [111], which coincides with the direction of displacement in the twin formation. The twin layers again disappear with load having an inverse sign (so-called mutual twin formation). The critical stress for the reciprocal twin formation is somewhat higher than that of

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Slippage Along the Boundaries of Twins During
Direct and Reciprocal Twinning of Iron

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the direct twin formation. A table offers data on the twin formation for direct and reciprocal twins. Various explanations for the formation and removal of twins are discussed. The authors finally thank R. I. Garber and B. G. Lazarev for their discussions. There are 9 figures, 1 table, and 7 references: 5 Soviet, 1 German, 1 British

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Physicotechnical Institute of the AS UkrSSR, Khar'kov)

SUBMITTED: June 24, 1959

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81620
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B122/B063

18.8200
AUTHORS:

Garber, R. I., Gindin, I. A., Polyakov, L. M.

TITLE:

Dispersion and Re-establishment of Contacts Between Micro-blocks During Plastic Deformation²⁶

PERIODICAL

Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1089 - 1095

TEXT: The low strength of solid bodies after deformation is ascribed to dislocations, fractures, and microcracks and the resulting concentration of strains which attain the value of theoretical strength in microregions. Furthermore, the formation, splitting, and disorientation of microblocks are observable. The concentration of strains may be regarded as an increase in latent energy which is due to the extension of the inner surface brought about by disorientation. The surface energy of the liberated parts of the block surfaces would pass over into latent energy. The block dimensions themselves have a specific value for every material. According to B. M. Rovinskiy and L. M. Rybakova (Ref. 7), this value constitutes a mean value of split and restored blocks. In this connection, the saturation of the latent deformation energy corresponds to the stabilization of the mean block

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dimensions. The surface energy is determined by formula: $\gamma = \frac{\alpha}{\beta} \frac{1 \rho Q}{\sigma} (1)$,
 where $\alpha = v/l^3$, v denotes the volume of the block, l its length, $\beta = S/l^2$,
 S is the surface, ρ is the material density, Q is the latent energy of
 plastic deformation on saturation referred to the sample mass, and σ is
 the mean surface tension. As an example, γ has the value 0.5 for copper,
 i.e., on plastic deformation of copper a considerable part of the block
 surfaces is without contact with the neighboring blocks. It is then consi-
 dered that a part of the latent deformation energies must be also ascribed
 to other causes, such as lattice defects, dislocations, and residual stres-
 ses. The latter are determined in metals roentgenographically, and do not
 amount to more than 2 % of Q . Atomic dispersion and imperfections, de-
 termined from the change of resistivity as a result of plastic deformation,
 correspond to only 5 % of the latent energy Q . Thus, almost the entire latent
 energy of the plastic deformation was found to be present as the energy of
 the free block surfaces. The process of contact re-establishment was studied
 on pressed and high-vacuum heated copper disks, on the change of the flow
 velocity of hydrogen through iron tubes, which were deformed at the temper-
 atures of liquid nitrogen, and finally, on the change, caused by annealing.

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Dispersion and Re-establishment of Contacts S/191/60/002/06/08/050
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in light dispersion intensity of deformed rock salt samples. The setups used for the investigation are shown in Figs. 1 - 5, and respective results in Figs. 6 - 9. The studies revealed that the activation energy of contact formation in copper decreases with rising pressure, i.e. the said formation proceeds very quickly at a certain pressure and also at low temperatures. In the case of iron, a recrystallization occurs under the given conditions, which, however, does not necessarily give rise to contacts. It is concluded therefrom that at a certain deformation stage there is a firm interlinkage between the various contact faces of the blocks besides dispersion and disorientation. There are 9 figures and 15 references: 10 Soviet, 3 English, 1 Japanese, 1 American.

ASSOCIATION: Fiziko-tekhnicheskii institut AN USSR, Khar'kov (Physico-
technical Institute of the AS UkrSSR, Khar'kov)

SUBMITTED: August 11, 1959

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81621

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B122/B063

18.8200

AUTHORS: Garber, R. I., Gindin, I. A., Lazarev, B. G., Starodubov, Ya.D.

TITLE: Low-temperature Recrystallization of Copper

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1096 - 1098

TEXT: The authors of the present article studied the recrystallization of copper which was first deformed at the temperatures of liquid hydrogen and nitrogen, and was then subjected to recrystallization at room temperature. Tubular copper samples (diameter: 1.5 mm; wall thickness: 0.45 mm) were used. The samples were first annealed at 800°C for 8 hours (at 10^{-6} torr). Special care was devoted to the perfect cleanliness of the inner wall of the tube. The sample was deformed in vacuo at 20 and 4.2°K perpendicular to the tube axis until the inner walls touched, and further, until the plastic deformation $\delta = 23\%$. The sample was then heated at low pressure, and kept at room temperature for 10 - 15 hours. Recrystallization was observed on a cut of the cross section of the tubes after deep etching, by using a metallographical microscope of the type MMM-6 (MIM-6) (Figs. 1 and 2). Small

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Low-temperature Recrystallization of Copper

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bridges of recrystallization grains were observed along the contact planes. With dropping deformation temperature the number of outgrowing grains increased. The experiments showed that copper deformed at low temperatures is well recrystallizable already at room temperature, and that the idea of temperature threshold of recrystallization is a preliminary one, i.e., when constructing the recrystallization diagram it is necessary to consider the temperature at which the plastic deformation is activated. There are 2 figures and 6 Soviet references.

ASSOCIATION: Fiziko-tehnicheskii institut AN USSR, Khar'kov (Physico-technical Institute of the AS UkrSSR, Khar'kov)

SUBMITTED: August 11, 1959

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E193/E483

18.8200

AUTHOR: Gindin, I.A.

TITLE: On the Effect of Preliminary Straining at 300°K on the Mechanical Properties of Technical Iron at 77°K

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 3, pp 447-455 (USSR)

ABSTRACT: According to the theory of dislocations, brittleness of the body-centred cubic metals is due to blocking of dislocations on dissolved impurities (Cottrell' atmosphere) or other obstructions. If this is true, it should be possible to lower the critical temperature of low-temperature brittleness by preliminary deformation in the temperature range in which the metal is ductile, followed by cooling through the temperature range within which blocking of dislocations takes place. The object of the investigation described in the present paper was to check this hypothesis by studying the low-temperature mechanical properties of technical iron, containing 0.03% C, pre-strained at room temperature. The experimental tensile test pieces (1.5 x 3.0 mm cross-section, 10 mm gauge) were prepared from a central portion of a

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On the Effect of Preliminary Straining at 300°K on the Mechanical Properties of Technical Iron at 77°K

forging. In order to completely remove the cold-worked surface layer, the test pieces were etched and electrolytically polished, after which they were vacuum annealed at 300° C for 4 h. In the course of the investigation the microstructure, grain size, character of deformation and distribution of the slip bands near the fracture of the test piece were studied. The treatment, illustrated in Fig 1, to which the test pieces were subjected comprised three stages: (a) preliminary straining within the elastic range (up to a stress σ_0) or preliminary plastic deformation (up to elongation δ_0) at room temperature (300°K), at a low ($v_1 = 0.4$ micron/sec) strain rate; (b) slow cooling (approximately 5°/min) of the test pieces under the load applied originally (ie with σ_0 or δ_0 maintained constant) to the liquid nitrogen temperature (77°K); straining the test piece to fracture at 77°K, at the normal strain rate of $v_2 = 30$ micron/sec. In all 12 specimens were investigated; the degree of preliminary elastic or plastic straining to which each specimen had

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been subjected is shown on a strain/stress diagram reproduced in Fig 2; numbers given by the points on this diagram denote the number of a given test piece, while the position of each point shows the magnitude of stress σ_0 and elongation δ_0 attained in preliminary straining. The numerical values are tabulated on p 449 under the following headings: number of the test piece; stress applied in the elastic range (σ_0 , kg/mm²); degree of plastic deformation (δ_0 , %). The results of the tensile tests at 77°K are reproduced in Fig 3, showing the automatically recorded strain/stress diagrams, curves a to z relating to specimens, subjected to preliminary straining, given by the following data:

a - not subjected to preliminary straining;
b - $\sigma_0 = 7.1$ kg/mm²; v - $\sigma_0 = 8.7$ kg/mm²;
g - $\sigma_0 = 15.8$ kg/mm²; d - $\sigma_0 = 19.5$ kg/mm²;
e - $\sigma_0 = 19.9$ kg/mm²; zh - $\sigma_0 = 21$ kg/mm²; z - $\delta_0 = 1\%$;
(the load and strain are represented in these diagrams in the scale 1 mm = 18 kg and 1 mm = 45 microns respectively).

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